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Prepared for:

The Defense Logistics Agency

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DLA-Army Materiel Command (AMC) Supplier Risk Assessment

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Executive Summary

Deloitte Consulting LLP was tasked by the Defense Logistics Agency (DLA) J74 Industrial Capabilities Program (ICP) to develop a methodology for DLA to support Army requirements for assessing supply chain risk and provide a baseline for future Army/DLA industrial base cooperation. The study was limited to 18,406 DLA managed items associated with Weapon System Designator Code (WSDC) "37A", the M2 Bradley Fighting Vehicle. The team completed Phase I of the study. Phase I included the following task:

1. Identify requirements for DLA's Sustainment Readiness Criteria (SRC) tool to enable a repeatable process of assessing industrial base risk; by item, supplier, and weapon system, that would:
 - a. Leverage DLA and Army existing data;
 - b. Enhance the Army's awareness of industrial base risks; and
 - c. Assist DLA's industrial capability and Warstopper Programs.

The team utilized the same risk methodology developed and utilized for a similar study with Naval Air Systems Command (NAVAIR), which focused more on active operational risks for DLA managed critical items – items matching NAVAIR systems that are currently being used in support of DoD operations. However, based on working group meetings with Army industrial base stakeholders, there was a clear need to look at a wider spectrum of industrial base risks to include industrial base sustainment risks, and wartime surge risks to include items that may not have current demand.¹

Table ES1 shows how the team organized the analysis into 3 Risk Areas – Active Operational, Surge, and Sustainment – and 6 Risk Types, nested within each Risk Area. It's important to note that the team focused on industrial base risks versus broader supply chain risks, which are inclusive of industrial base risks, but would also include DLA operational issues, such as procurement delays, demand forecasting inaccuracy, and supply management issues. The team defined industrial base risks as supplier related current issues or potential risks, which would include the following:

- **Capacity limitations** during wartime surges or in support of current operational requirements.
- **Material availability (Manufacturing inputs)** issues or risks during wartime surges or in support of current operational requirements.
- **Source of supply availability** issues or risks for critical items needed during wartime surges or in support of current operational requirements.

¹ Identifying surge risk has been a core mission of the DLA Warstopper program for many years and methodologies have already been established.

- **Supplier sustainment** issues or risks caused by a downturn in requirements due to a reduction in OPTEMPO for weapon systems or closure of weapon system production lines.

Table ES1 – Bradley Fighting Vehicle Risk Assessment for DLA managed items

Risk Area	Risk Type	Data Table	Filter Detail
Active Operational	Sourcing	Summary Risk Metrics	<ul style="list-style-type: none"> Leading Indicator is "Risk" (any type) WSEC 1, 5, Or 6 Demand Value Class A Or B PLT Score 3 Or 4 2 year CAGE Cnt = Null 5 year CAGE Cnt = Null LTC Flag = Null <u>Optional:</u> Inactive part number (not applied) <p>Item Count : 10</p>
	Supplier Delivery	Supplier Risk Metrics	<ul style="list-style-type: none"> Late orders > 30d And On-time delivery < 75% Or 2) Minimum Contract Lead Time is 20% > PLT (by CAGE Supplier Delivery Risk = 1) WSEC 1, 5, Or 6 Demand Value Class A Or B PLT Score 3 Or 4 2 year CAGE Cnt = 1 Leading Indicator is "Risk" (any type) <p>Item-CAGE Pairs: 3</p>
Surge	Item Surge	Summary Risk Metrics	<ul style="list-style-type: none"> MWR is Not Null – Items w/ wartime requirements only Items w/ simulated wartime fill rate < .75 (Sim Wartime FR Flag = 1) <u>Optional:</u> Filter on items unique to specific weapon systems (applied) <p>Item Count: 335</p>
	Sourcing	Summary Risk Metrics	<ul style="list-style-type: none"> MWR is Not Null – Items w/ wartime requirements only PLT Score 3 Or 4 2 year CAGE Cnt = Null; 5 year CAGE Cnt = Null LTC Flag = Null Items w/ simulated wartime fill rate < .75 (Sim Wartime FR Flag = 1; WSEC 1, 5, or 7 implied) <u>Optional:</u> Inactive items (no demand in last 2 years) <p>Item Count: 51</p>
Sustainment	Operational Supplier Sustainment	Supplier Risk Metrics	<ul style="list-style-type: none"> Supplier Density % > 25% And PO_Slope is Negative Or Last Qtr Gap is flagged (Sustainment Flag = 1) WSEC 1, 5, Or 6 Demand Value Class A Or B 2 year CAGE Cnt = 1 <u>Optional:</u> At least 6 Qtrs of demand over the last 8 Qtrs (applied) <u>Optional:</u> Filter on items unique to specific weapon systems (not applied) <p>Item-CAGE Pairs: 2</p>
	Surge Supplier Sustainment	Supplier Risk Metrics	<ul style="list-style-type: none"> Supplier Density % > 25% And PO_Slope is Negative Or Last Qtr Gap is flagged (Sustainment Flag = 1) Demand Value Class A Or B 2 year CAGE Cnt = 1 MWR is Not Null – Items w/ wartime requirements only <u>Optional:</u> At least 6 Qtrs of demand over the last 8 Qtrs (applied) <u>Optional:</u> Items w/ simulated wartime fill rate < .75 (wartime stock out risk) (applied) <p>Item-CAGE Pairs: 2</p>

The team developed a repeatable database structure that pulls in raw enterprise data and standard DLA datasets available from the DLA Office of Defense Operation Research and Resource Analysis (DORRA) and identifies the most important items that should be reviewed by DLA Industrial Specialists for industrial base risks.² Figure ES1 shows the count of DLA managed items or item-supplier combinations that were flagged for the specific Risk Area/ Type, using this risk methodology based on DLA data, and require validation.

The following provides specific short term and long term requirements for the SRC:

² Although several of the metrics are technically issues (current events) versus risks (potential events), meaning an item/ supplier may already have or have had a supply chain problem, e.g. late supplier deliveries, the problem may not yet be impacting DLA's support to the Warfighter, e.g. due to sufficient inventory despite late deliveries. Since DLA Warfighter or weapon system supportability risk is the overall risk management objective for the team's methodology, we include these item/ supplier issues in our risk assessment to help determine the likelihood and magnitude of the risk.

Short Term SRC Requirements:

1. Expand the scope of DLA managed items to provide DLA Industrial Specialists visibility into critical, non-readily available items³ within each DLA supply chain that may have potential industrial base problems.
2. Utilize the item/ supplier risk identification or “flagging” methodology developed for this study to identify Tier 1 risks (highest priority risk rating) and establish a process for incorporating changes to the methodology based on lessons learned or user input, e.g. Configuration Control Board (CCB).
3. Establish a short term working group to develop workflow functionality to support risk identification and root cause analysis:
 - 3.1.1. Edit item/ supplier records in the Tier 1 group⁴ (red color coded) to include manually adding item/ supplier records and deleting them, if they are not industrial base risks.⁵
 - 3.1.2. Classify Tier 1 risk records according to a simple risk status structure, and
 - 3.1.3. Provide additional supporting documentation and notes.
4. Provide functionality for each Risk Type to view item/ supplier risk records by DLA supply chain and Federal Supply Class (FSC) and name.
5. Provide functionality for each Risk Type to view item/ supplier risk records by weapon system for items 1) unique to or associated with specific weapon systems based on DLA’s weapon system file and 2) predominantly used by a weapon system based on an annual customer requisition analysis, if the DLA data source is available.
6. Provide system access to underlying data and system views for other DoD industrial base stakeholders that are working on risk assessments and mitigation actions in collaboration with DLA management.
7. Restrict access to risk management process updates, described in Requirement #3, to authorized DLA industrial base representatives in order to maintain control of risk management process.⁶

³ Items with a highly flexible supply base that can easily support DoD requirements and can be eliminated from the SRC population to reduce data management requirements.

⁴ Tier 1 would be aligned with the red color coding currently used in the SRC.

⁵ As noted in the NAVAIR study final report, specific data fields within DLA’s enterprise business systems that provide visibility into industrial base issues, e.g. reason codes that indicate the root cause of a supplier delay, do not appear to exist. DLA’s electronic Capability Assessment Plan (eCAP) system captures supplier coverage of the Service’s Surge & Sustainment (S&S) requirements; however, actual supplier capacity and lead time data are not captured – only the supplier’s monthly capability relative to the S&S requirement (either meets the requirement or a shortfall is noted). In addition, eCAP data is only collected for items with surge clauses inserted into long term contracts, which limits the utility of the data for the risk methodology. Based on these limitations, there may be a number of false positives – item/ supplier records “flagged” as having an industrial base risk.

Suggested Longer Term Requirements:

1. Establish a semi-annual review process with various DoD industrial base stakeholders to provide opportunities to improve the SRC and better align its supporting functionality for the Joint Industrial Capability Analysis Process (JICAP).
2. Based on lessons learned from initial use of the SRC system in support of the DoD industrial base mission, refine criteria for Tier 1 and develop new criteria for Tier 2 and 3 item/ supplier groups for each Risk Type. These item/ supplier risk records may not exhibit all or most of the highest priority risk characteristics for the specific Risk Type, but may exhibit a combination of characteristics, which still warrant management review.⁷
3. Provide functionality to support DLA Industrial Capability Program level industrial base time series analysis, including trend analysis across multiple categorization views, e.g. DLA supply chain, weapon system, and FSC.
4. Provide functionality to support logistics analysis, e.g. plot graphs of item level demand and supply data, to support the risk identification and root cause analysis business processes.
5. Seek direct access to DLA enterprise data sources in order to obtain more timely data and reduce data management requirements.

Additional details of the specific metrics and database structure have been provided in the body of the report and the appendices.⁸

Based on the value-added analysis and metrics developed in Phase I, the core team of AMC and DLA stakeholders will move forward with Phase II which will focus on methodology refinement, “flagged” item/ supplier validation business processes, and risk mitigation for a sample “flagged” or “at-risk” item. This next phase will establish the proof of concept for the Root Cause Analysis portion of the JICAP for the at-risk items identified in Phase I. The tasks involved will revolve around the joint industrial base community’s efforts in identifying supply constraints within the industrial base. The Defense Contract Management Agency (DCMA) will also support Phase II by leveraging their working relationship with participating suppliers in order to complete an assessment that will gather specific details concerning the constraint, e.g. raw material lead time, process bottlenecks, contracting issues, etc. Once the root cause has been identified the team can then begin to explore ways in which to mitigate the item/ supplier risk by conducting a detailed supplier capability analysis, and thus recommending actionable solutions for the joint industrial base community to execute.

⁶ This does not imply that other DoD representatives are excluded from the risk management process; it only means a single DLA representative would be updating the SRC system.

⁷ Other risk tiers would be aligned with other color codes currently used in the SRC.

⁸ Actual databases have not been included in the report, but can be provided to the SRC development team to assist in developing enhancements.

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Section 1 – Introduction

Deloitte Consulting LLP was tasked by the Defense Logistics Agency (DLA) J74 Industrial Capabilities Program (ICP) to conduct a joint supplier risk assessment with Army Materiel Command (AMC) to develop a methodology for DLA to support Army requirements for assessing supply chain risk and provide a baseline for future Army/ DLA industrial base cooperation. The AMC study is the second study conducted as part of a larger effort to improve the effectiveness of the efforts of DLA ICP and Service industrial base counterparts. Prior to this study, DLA completed Phase I of a similar study with Naval Aviation Systems Command (NAVAIR). For the NAVAIR study, the DLA team developed a baseline methodology for identifying at-risk items and suppliers, which focused more on active operational DLA managed, critical items – items matching NAVAIR systems that are currently being used in support of DoD operations. This joint effort with AMC not only focused on active operational risk, but also considered sustainment and surge risk, all three areas of which are defined in Section 2.1 and discussed throughout this report.

1.1 Background – DLA Industrial Capabilities

Identifying surge risk has been a core mission of the DLA ICP for many years. Risk management policies and processes have been established in which the Services' annual wartime requirements are reviewed and depending on DLA's inventory position for the item, these requirements may be inserted into DLA long term contract surge clauses in order to obtain a contractual commitment from a supplier to meet some or all of the surge requirements. In addition, the program continues to commission numerous industrial base studies each year focusing on known supplier capability issues or risks in the DLA supply chain where critical surge requirements cannot be met by the industrial base.

Based on the findings from these studies and industrial base assessments regarding surge and/or sustainment risks, DLA's ICP may make investments using Industrial Preparedness Funding available to the Agency to better enable suppliers to meet Service requirements (e.g. additional production equipment or pre-positioned, long lead time materials). For example, in the Troop Support supply chain, DLA has made significant investments in more well-known critical items, such as Nerve Agent Antidote Auto injectors (NAAA), Meals Ready to Eat (MREs), and chemical protective suits, which exhibit wartime requirements that are typically orders of magnitude beyond peacetime demand. Without these investments, DLA's suppliers would not be able to ramp-up production to surge quantities within the time required, or even maintain the capability in light of declining requirements.

Although these investments recommended in the studies have improved readiness, the program has been limited in its ability to identify items where there is an intersection between current operational issues and potential future surge and sustainment risks, as identified traditionally through Service submitted requirements. In other words, the program would benefit more from a supplier engagement in which each of these risks could be mitigated – weapon system readiness could be improved (fewer non-mission capable systems) and the supplier would be

better positioned for unplanned wartime requirements – versus focusing resources on a healthy item that may or may not ever surge in the future.

As stated in the NAVAIR study final report, the DLA ICP does not make many investments annually for Class IX repair parts or hardware items. One reason has been inaccuracy with the Services' wartime requirements – lack of accuracy in terms of the right item and/ or quantity required, as seen in recent operations. Another reason for limited ICP investments in weapon system support has been the scale of the Class IX repair part supply chain in terms of number of items and suppliers and the difficulty in pin-pointing a “supplier” or industrial capability related problem. Currently there is no formal, well-defined process to identify supplier related, industrial capability issues or risks with DLA managed weapon systems or Class IX repair parts. DLA's ICP often has relied on the occasional supply chain issue that trickles up to DLA management's attention before conducting an industrial base assessment.

In response to the need to be more effective in pin-pointing item and supplier risks for industrial base mitigation strategies, the DLA ICP developed a pilot Sustainment Readiness Criteria (SRC) web-based tool in 2011 that attempts to classify risk at the item level, supplier level, and weapons system level. This study is expected to provide new requirements for the ongoing development of the SRC to expand its current risk management scope beyond identifying items and suppliers with sourcing risks.

1.2 Joint DoD Industrial Base Collaboration

For this risk analysis the study team worked in close conjunction with AMC's Edgewood Chemical Biological Center (ECBC) and stakeholders at Tank-automotive and Armaments Command (TACOM) Life Cycle Management Command (LCMC) to address the study deliverables as outlined in Section 1.3. This collaborative effort was pursued as part of an overall strategy by DLA and participating Services to develop a process for identifying and mitigating item and supplier risk. This strategy is new for DLA's ICP and expands the involvement of Service industrial base counterparts in the industrial base assessment process beyond simply submitting and validating annual wartime requirements.

Based on working group meetings with Army industrial base stakeholders, there was a clear need to look at a wider spectrum of industrial base risks beyond active operational and wartime surge risks to include industrial base sustainment risks. Within these parameters AMC selected the Army's M-2 Bradley Fighting Vehicle (BFV), a weapon system that is still active, but may face sustainment issues in the next few years. At the time the study was commissioned, the BFV production line in York, Pennsylvania was expected to close in 2013; however, Congress recently appropriated additional funding for upgrades to this vehicle. Sustainment risks for the BFV supply chain or base are still relevant because the production line may be at-risk of closure thereafter. The Army study representatives wanted to understand the extent of the current BFV supply base and have the ability to understand which suppliers would be most impacted by these events. In response the team added several new metrics to the methodology used in the NAVAIR analysis to have better visibility of sustainment risks, which are described in Section 2.2.5.

Like NAVAIR the Army did not have good visibility of reliable supplier related data to assess potential risk factors facing the BFV weapon system. By teaming with DLA, the Army can gain access to purchase order data from DLA's Office of Defense Operations Research and Resource Analysis (DORRA). With the support and experience of the DLA study team the joint industrial base group was able to make better sense of the data and develop meaningful analysis on the pathway to understanding risk factors impacting the BFV weapon system.

1.3 Purpose, Scope, & Study Tasks

The purpose of this study was to determine a repeatable methodology for DLA to support Army requirements for assessing supply chain risk and provide a baseline for future Army/DLA industrial base cooperation. The study team's analysis was focused on the BFV, Weapon System Designator Code (WSDC) 37A as chosen by the Army, which included a population of 18,406 DLA managed items.

The study initially included the following tasks:

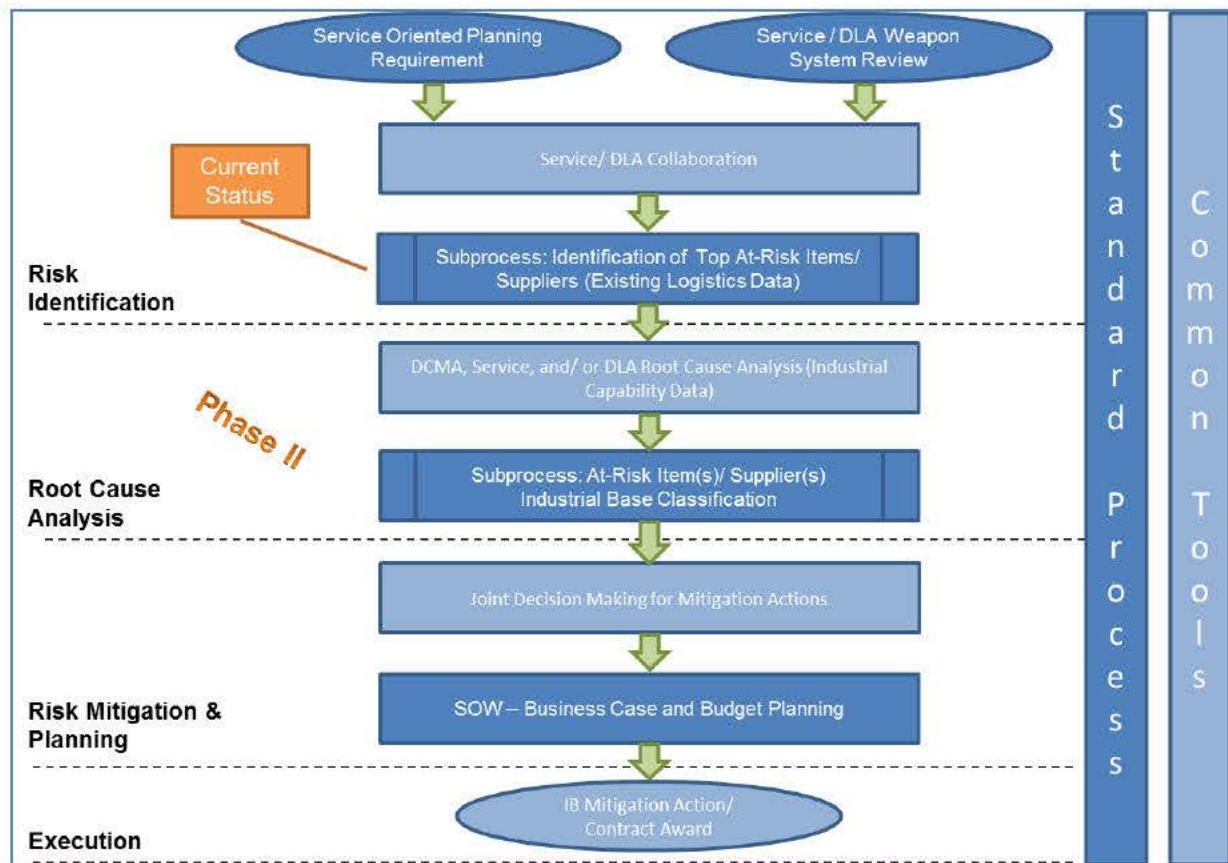
1. Identify requirements for DLA's Sustainment Readiness Criteria (SRC) tool to enable a repeatable process of assessing industrial base risk; by item, supplier, and weapon system; that would:
 - a. Leverage DLA and Army existing data,
 - b. Enhance the Army's awareness of industrial base risks; and
 - c. Assist DLA's industrial capability and Warstopper Programs.
2. For the selected in scope program:
 - a. Assess common suppliers between Army Prime contractors and DLA; and
 - b. Build a supply chain simulation model of a primary risk item (using ProModel software) to evaluate the supply chain operation.
 - c. Build an industrial base "watch-list" which identifies the top 50 "highest" risk producers in the M1 Main Battle Tank supply chain.
3. Based on Tasks 1 and, 2; identify strategies and specific actions for mitigating the highest risk production capability for the selected program.

As the DLA study team continued to collaborate with AMC throughout the analysis it became clear that the effort should be broken up into multiple phases. The team only completed Phase I of the study, which included only Task One and its subparts, due to the additional time required for the Army and DLA stakeholders to review, contribute to, and understand the supply chain risk methodology. Subsequent phases of this analysis will focus less on establishing a methodology for identifying risk and more on developing a joint process for conducting supplier and item-focused assessments. Each additional phase will be planned and commissioned at the discretion of the DLA Industrial Capabilities Program Manager, based on continued collaboration with DoD industrial base stakeholders and progress towards milestones and program objectives. Phase II is discussed further in Section 2.4.

1.4 Joint Industrial Capability Analysis Process (JICAP)

By taking advantage of the established methodology and lessons learned from the DLA-NAVAIR effort, AMC and DLA were better able to articulate expectations and the desired outcome of the team's analysis to include an overall process definition for future industrial base collaboration efforts. The overarching goal was to develop a standard, repeatable process to identify items and suppliers using a common language and tools between stakeholders viewing and working with the same data or database of record. Beyond simply identifying item and supplier risk, the long-term goal of the foundational work laid out in this report will be to determine the root cause of the item/ supplier issue and if it is related to constraints in the supply chain or supplier viability, then mitigate the risk to the Warfighter through acquisition planning and industrial base preparedness measures. Identifying the root cause of a current issue or potential risk (capability to meet unplanned wartime requirements) will require an ongoing collaboration between DLA, the Services, and the Defense Contract Management Agency (DCMA) to determine and differentiate true industrial base versus non-industrial base issues – those caused by pricing issues, procurement delays, quality issues, sourcing issues, etc. This new Joint Industrial Capability Analysis Process (JICAP) is illustrated in Figure 1.⁹

Figure 1 – Joint Industrial Capability Analysis Planning Cycle



⁹ The name of this new process is may undergo future iterations.

The JICAP is intended to be repeatable and scalable to any population of items, suppliers, weapon systems, or programs as identified by the stakeholder(s) involved. The DLA study team has developed the JICAP as a *standard process* using shared data to 1) Identify risk; 2) Conduct root cause analysis on the at-risk item and/ or supplier; 3) Develop a risk mitigation strategy; and then 4) Execute the risk mitigation strategy. The JICAP relies on *common tools* and metrics to facilitate communication among DoD stakeholders. With this process in place the joint industrial base community could have a dashboard of metrics available to evaluate trends in weapon system performance. The community could track the number of at-risk items/ suppliers over time depending on the refresh rate of the metrics data. The joint DoD analysis team could prioritize and focus its resources on resolving issues with the weapon systems having the most significant number of risk items in a particular risk area or risk type. Additional views of risk could be applied to a supply chain or even weapon system view of risks to gain deeper insight of risk overlap. The details of this proposed dashboard will be developed as part of subsequent phases of this joint effort.

1.4.1 Risk Identification

Traditionally risk identification within DLA's program has been driven by 1) the Services' annual wartime requirements and 2) the occasional industrial capability shortfall risk noted by a supplier in response to the Services' requirements in a long term contract surge clause or more frequently, as a result of known supplier constraints or sustainment problems brought to the attention of the DLA ICP. The capabilities within this phase of the JICAP will be greatly improved with a better process and supporting system (SRC system) for pin-pointing the most important items and suppliers that should be reviewed by DLA Industrial Specialists (IS) in collaboration with other DoD industrial base stakeholders.

Not only would an improved system help automatically flag or classify "at-risk" items, but the SRC system would also support Ad Hoc weapon system analyses, e.g. identifying weapon systems that are performing poorly and not consistently mission capable, have decreasing requirements, or are experiencing known issues in its transition to DLA for sustainment. The SRC system would also provide functionality to manually flag DLA items not identified automatically through the flagging process. The risk identification process is only directional; the collaborative analysis team must then filter the item subset for false positives to establish a list that can be prioritized for actual risk mitigation. The risk methodology that supports risk identification in this phase of the JICAP is described in more detail in Section 2.

1.4.2 Root Cause Analysis

The root cause analysis phase of the JICAP is where more focus is placed on the subset of items and suppliers identified as having specific risks. Through the collaborative efforts of DCMA, the Services, and DLA, at-risk items and suppliers are evaluated further to better understand whether or not there is an industrial base risk. Here, the role of the IS is very important to serve as the lead in the industrial base risk assessment, as well as serving as a liaison to DLA's supply chain management personnel, e.g. supply planners and contracting personnel, to gather additional information to better understand the root cause of the problem.

The analysis team may have to interact with post contract award buyers, and even suppliers that are willing to participate, in order to determine the basis of the risk. Ultimately the objective of this phase is to determine if the at-risk item and/ or supplier is an industrial base issue or if the issue is caused by DLA demand and supply management problems (non-industrial base [non-IB]).

For non-IB issues the analysis team may be able to bring the issue to the attention of other process owners for resolution using other DLA processes, e.g. expediting procurements, working with customers to improve forecast accuracy, etc. However, DLA personnel may already be working on resolving the issue. With respect to IB issues the DLA ICP can initiate an industrial base assessment to work with the supply base to determine capability, capacity constraints, lead time issues, etc, using well established processes.

1.4.3 Risk Mitigation and Planning

DLA's existing processes for Industrial Base Risk Mitigation and Planning would remain relatively the same within the JICAP; however, the expectation would be greater participation of Service industrial base representatives to provide a Service perspective and input into the mitigation strategy. In this phase, recommendations are developed to mitigate the industrial base risk, such as industrial preparedness measures or investments to reduce PLT by establishing raw material buffer stocks, augment capacity using Government Funded Equipment (GFE) to alleviate production bottlenecks, or sustain a supplier through an Industrial Base Maintenance Contract (IBMC). This phase may require development of business cases to support an investment, acquisition documents, such as Statements of Work (SOW), and acquisition development coordination with contracting teams/ personnel.

1.4.4 Execution

This phase includes post-investment asset management of GFE and/or buffer materials, as well as continued monitoring of "at-risk" items, if an investment decision is postponed. Supply contracts, which include industrial preparedness investments, may be coming close to ending, and thus decisions may be needed to execute the most appropriate exit strategy for the item. DLA IS teams may need to re-engage joint industrial base stakeholders on whether or not the mitigation strategy is still required by taking a step back into the previous phase of Risk Mitigation and Planning. As mentioned earlier in this section, the analytical methodology provided in this report and embedded in the database structure will have the greatest impact on improving the capabilities within the Risk Identification phase of the JICAP, and is discussed in more detail in the next section.

Section 2 – Risk Identification Methodology

This section provides an overview of the team's risk methodology developed to facilitate risk identification or automatic flagging of items and suppliers for further examination to more efficiently focus limited industrial base resources. It also provides actual items and suppliers that exhibit certain risk characteristics along different risk types of interest to both the Army and DLA stakeholders.

2.1 Risk Identification Overview

During working group discussions with Army study representatives, it became clear that the risk categorization process needed to be expanded and better organized into various risk types because the different industrial base risks being discussed each required a unique set of metrics to identify "at-risk" items and/or suppliers. For example, if you are concerned about sourcing risks for critical items, you need to look at items without a history of DLA buys. However, if you are looking for supplier delivery risks, you need to look at suppliers with DLA buys and their performance relative to scheduled delivery dates. In response, the team defined the various industrial base risks of interest to the stakeholders, organized them in a simple classification, and established a set of criteria to identify items and suppliers with each risk type's relevant risk characteristics. This is a different approach, as compared with other risk assessment efforts, which typically use a scoring methodology based on the number of risk flags or indicators.¹⁰ Research into risk scoring methodologies like DLA's 2010 LAV R&D project that was conducted as part the NAVAIR study indicated that items with higher risk scores did not become material availability issues at significantly higher rates than those with lower scores. Consequently, the study team limited the analysis here to only assigning items that met certain filter criteria to particular risk categories and refrained from making the conclusion that items that hit more than the minimum number of flags for a particular risk type could be ranked or scored as having "more risk" than others.

Table 2 shows how the team organized the analysis into *three* Risk Areas – Active Operational, Surge, and Sustainment – and *six* Risk Types, nested within each Risk Area. The *six* Risk Types capture the various industrial base risks discussed at the working group meetings, but new Risk Types can be added, as necessary. The Risk Areas¹¹ are described as follows:

- **Active Operational Risks** – DLA Warfighter or weapon system supportability risks for critical items currently being used in support of DLA customers.
- **Surge Risks** – DLA Warfighter or weapon system supportability risks for critical items needed by DLA customers during wartime based on official Service requirements or DLA estimates based on historical wartime usage.

¹⁰ DLA's LAV R&D project and AMC's SERA system

¹¹ An alternative categorization process could include Active Operational Risks and Surge Risks only to highlight the key difference being 1) operational risks for items used now with or without wartime requirements and 2) a projection of risks, if there was a wartime surge event. Sustainment could become a Risk Type under both Active Operational and Surge.

- **Sustainment Risks** – DLA Warfighter or weapon system supportability risks for critical items related to decreasing DLA supplier ordering requirements. Items could either be currently needed in support of DLA customers and/ or in wartime.

Table 2 – Data Filtration Methodology by Risk Area & Type

Risk Area	Risk Type	Data Table	Filter Detail
Active Operational	Sourcing	Summary Risk Metrics	<ul style="list-style-type: none"> Leading Indicator is "Risk" (any type) WSEC 1, 5, Or 6 Demand Value Class A Or B PLT Score 3 Or 4 2 year CAGE Cnt = Null 5 year CAGE Cnt = Null LTC Flag = Null Optional: Inactive part number (not applied) Item Count : 10
	Supplier Delivery	Supplier Risk Metrics	<ul style="list-style-type: none"> Late orders > 30d And On-time delivery < 75% Or 2) Minimum Contract Lead Time is 20% > PLT (by CAGE Supplier Delivery Risk = 1) WSEC 1, 5, Or 6 Demand Value Class A Or B PLT Score 3 Or 4 2 year CAGE Cnt = 1 Leading Indicator is "Risk" (any type) Item-CAGE Pairs: 3
Surge	Item Surge	Summary Risk Metrics	<ul style="list-style-type: none"> MWR is Not Null – Items w/ wartime requirements only Items w/ simulated wartime fill rate < .75 (Sim Wartime FR Flag = 1) Optional: Filter on items unique to specific weapon systems (applied) Item Count: 335
	Sourcing	Summary Risk Metrics	<ul style="list-style-type: none"> MWR is Not Null – Items w/ wartime requirements only PLT Score 3 Or 4 2 year CAGE Cnt = Null; 5 year CAGE Cnt = Null LTC Flag = Null Items w/ simulated wartime fill rate < .75 (Sim Wartime FR Flag = 1; WSEC 1, 5, or 7 implied) Optional: Inactive items (no demand in last 2 years) Item Count: 51
Sustainment	Operational Supplier Sustainment	Supplier Risk Metrics	<ul style="list-style-type: none"> Supplier Density % > 25% And PO_Slope is Negative Or Last Qtr Gap is flagged (Sustainment Flag = 1) WSEC 1, 5, Or 6 Demand Value Class A Or B 2 year CAGE Cnt = 1 Optional: At least 6 Qtrs of demand over the last 8 Qtrs (applied) Optional: Filter on items unique to specific weapon systems (not applied) Item-CAGE Pairs: 2
	Surge Supplier Sustainment	Supplier Risk Metrics	<ul style="list-style-type: none"> Supplier Density % > 25% And PO_Slope is Negative Or Last Qtr Gap is flagged (Sustainment Flag = 1) Demand Value Class A Or B 2 year CAGE Cnt = 1 MWR is Not Null – Items w/ wartime requirements only Optional: At least 6 Qtrs of demand over the last 8 Qtrs (applied) Optional: Items w/ simulated wartime fill rate < .75 (wartime stock out risk) (applied) Item-CAGE Pairs: 2

The *three* Risk Areas are considered to be supply chain risks, which could include many other Risk Types that may or may not be related to industrial base issues or risks, such as DLA operational issues, e.g. procurement delays, demand forecasting inaccuracy, and supply management issues. Other organizations or process owners within DLA are responsible for addressing these types of problems related to broader supply chain processes, e.g. improving forecasting accuracy, expediting procurements etc. On the other hand, the DLA Industrial Capabilities Program is the only DLA organization responsible for ensuring there are adequate supplier capabilities available to meet wartime requirements. For example, if a DLA supply planner does not have forecasted requirements for a critical item that experiences high demand during wartime, the stock will be drawn down and no additional orders will be placed with suppliers in accordance with DoD supply policies. Although these policies reflect good stewardship of limited resources, they could negatively impact the industrial base, especially if the supplier has an active production line and/or the item's sales are financially essential to the supplier's business operations. In this example, the DLA Industrial Capabilities Program can take action to mitigate the impact on the industrial base, e.g. investments in long lead time

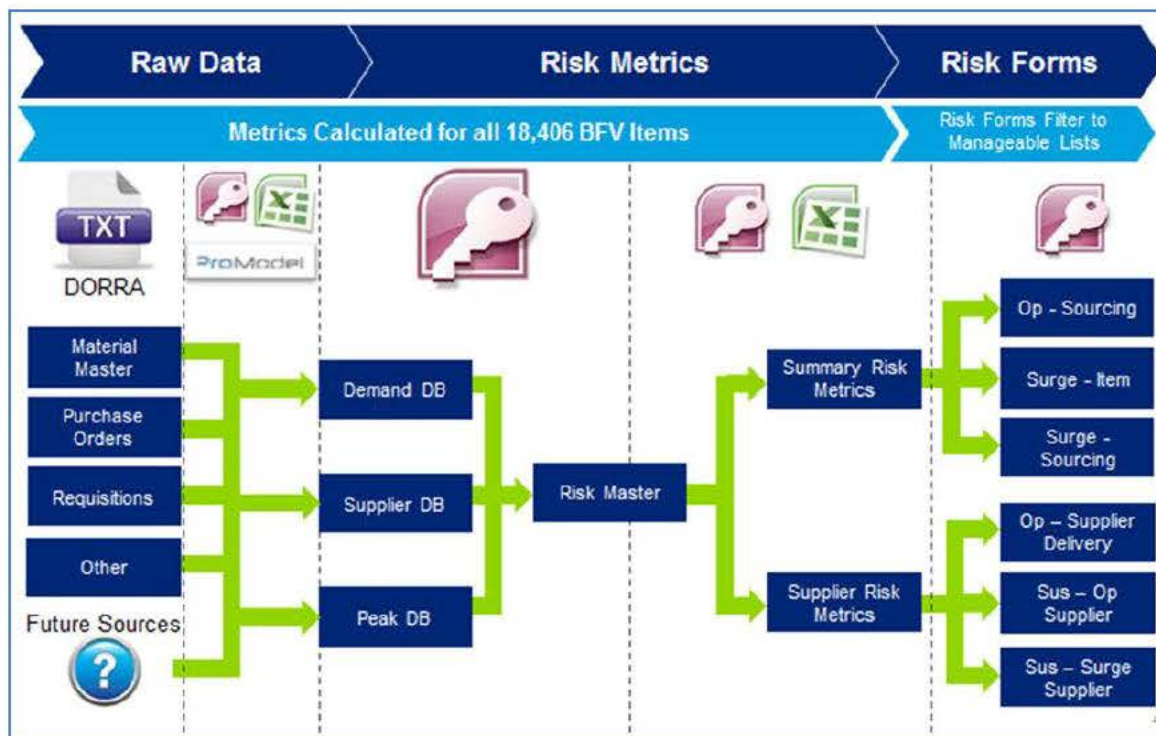
materials, industrial base maintenance contracts. Rather than identifying issues as they are brought to the attention of DLA's ICP, the program needs better visibility into these types of surge and sustainment risks.

Given the scope of the DLA Industrial Capabilities Program, the team defined industrial base risks as supplier related current issues or potential risks, which would include the following:

- **Capacity limitations** during wartime surges or in support of current operational requirements.
- **Material availability (Manufacturing inputs)** issues or risks during wartime surges or in support of current operational requirements.
- **Source of supply availability** issues or risks for critical items needed during wartime surges or in support of current operational requirements.
- **Supplier sustainment** issues or risks caused by a downturn in requirements due to a reduction in OPTEMPO for weapon systems or closure of weapon system production lines.

The team developed a repeatable database structure that pulls in raw enterprise data and standard DLA datasets available from DORRA and identifies or pin-points the most important items along six different Risk Types. Figure 2 illustrates the methodology and the transformation of the data.

Figure 2 – Risk Analysis Methodology



The data originates in the form of DORRA text files. Using off-the-shelf desktop software, the data is used in calculations in a series of databases that eventually produce two underlying risk metrics tables, Summary Risk Metrics and Supplier Risk Metrics. These tables contain all the risk statistics and characteristics for all 18,406 BFV items. The final step uses risk forms to filter the 18,406 items into smaller, manageable lists corresponding to six identified Risk Types (two for each risk area), that should be reviewed and validated by industrial specialists for industrial base risks. The individual Risk Types are described in the next section.

2.2 Risk Identification by Risk Type

This section defines each of the six Risk Types and the criteria applied to identify the most important “at-risk” items or suppliers. As described earlier, the following are the 6 Risk Area/Types:

- Active Operational – Sourcing Risk
- Active Operational – Supplier Delivery Risk
- Surge – Item Surge Risk
- Surge – Sourcing Risk
- Sustainment – Operational Supplier Sustainment Risk
- Sustainment – Surge Supplier Sustainment Risk

The team provides a baseline recommendation for a set of criteria or filters to apply to identify smaller sub-sets of the most important items/ suppliers for each Risk Type to more effectively focus industrial base resources. However, as more experience is gained by industrial base analysts using the metrics for each Risk Type, a tiered system can be developed to highlight other groups of items/ suppliers that might not meet all of the risk criteria, e.g. Tier One and Tier Two risk groups within the Sustainment – Operational Supplier Sustainment Risk Type. The team used MS Access forms that apply appropriate filters on one of the two basic risk metrics tables, Summary Risk Metrics (NIIN level) or Supplier Risk Metrics (NIIN-Supplier pairs), in order to filter from the total population only those items that share the characteristics that define the risk type. For in-depth definitions of all risk metrics, please see Appendix B. The following sections describe each risk form and its corresponding filters in greater detail.

2.2.1 Active Operational – Sourcing Risk

Active Operational - Sourcing Risk is defined by items that have active demand in the last year; no DLA buys in the last *five* years, and are predicted to stock out. Figure 3 shows the filters that are applied to the Summary Risk Metrics table in order to create this list.

Figure 3 – Active Operational - Sourcing Risk Form

Op - Sourcing Risk							
Leading Ind Flag	WSEC	Demand Value Classification	PLT score	2yr CAGE Count	5yr CAGE Count	LTC Flag	
1	(Multiple Items)	(Multiple Items)	(Multiple Items)	(Blank)	(Blank)	N	
Drop Column Fields Here							
Drop Row Fields Here	NIIN	Item Name	Sales Value	AMSC	AAC	Leading Ind	Lagging Ind
	9221200	FIRST AID KIT, GENER	\$1,173,479.88	L	D	Both-Risk	
	14689390	ELECTRONIC FILTER	\$253,249.82	R	D	Both-Risk	Issue
	14584362	CABLE ASSEMBLY, PRIN	\$52,215.39	G	D	Sim-Risk	Issue
	14584369	CABLE ASSEMBLY, PRIN	\$51,046.18	G	D	Both-Risk	
	14643654	GEAR, SPUR	\$45,308.62	G	Z	Sim-Risk	
	15433431	CABLE ASSEMBLY, SPEC	\$31,192.98	G	D	Both-Risk	
	14966822	POWER SUPPLY	\$21,624.64	G	Z	Sim-Risk	
	11404555	NUT, SELF-LOCKING, DO	\$17,825.20	G	D	Sim-Risk	
	15425213	CABLE ASSEMBLY, SPEC	\$15,817.67	G	D	Sim-Risk	
	14518911	GEAR, SPUR	\$14,553.74	G	Z	Both-Risk	
10							

Listed at the top of the form in the filter bar, the following item characteristics (metrics) were selected to define this list: only essential items (WSEC 1, 5, and 6), items belonging to the groups that accounts for more than 85% of total spend for the BFV (Demand Value Classification A and B), PLT's longer than 120 days (PLT Score 3 and 4), no DLA buys in the last *five* years (2yr and 5yr CAGE Count is Null), the item is not on a Long Term Contract (LTC Flag is Null), and the item is predicted to stock out according to either the DLA forecast or the study team's simulation (Leading Ind Flag is 1).

The intent of these filters is to first identify items that have active demand, are predicted to stock out within the next *six* months, but have no recorded DLA purchase orders within the last *five* years and are not on a Long Term Contract (LTC). Such items are more likely than others to have both a need for sourcing at some point in the near future (DLA forecasts or recent demand trends indicate the item may stock out) and possible issues finding a qualified supplier.

The other filters that are not related to sourcing (Demand Value Classification, WSEC, and PLT) were included for prioritization purposes. Given limited resources to dedicate toward risk mitigation, DLA should consider restricting the list of risk items to ones that are critical to a weapon system, account for a large amount of spend, and have long production lead times; as mitigating risk for these items would have the largest impact on readiness. If more mitigation resources are available or the items on the restricted list fail validation, then these prioritization filters can be loosened to include more. Where appropriate, the prioritization filters are applied to many of the other risk forms. DLA acquisition resources and Weapon System Support

Managers (WSSM) may already be focusing on these items to get contracts awarded, since some have encountered backorders.

Item data related to acquisition and sourcing, the Acquisition Advice Code (AAC) and Acquisition Method Suffix Code (AMSC), and the lagging indicator which reports a current fill rate problem are provided in the body of the form for information purposes.

2.2.2 Active Operational – Supplier Delivery Risk

Active Operational – Supplier Delivery Risk is defined by items with active demand, a single DLA source, and potential supplier delivery risk. Figure 4 shows the filters that are applied to the Supplier Risk Metrics table in order to create this list.

Figure 4 – Active Operational: Supplier Delivery Risk Form

Op - Supplier Delivery Risk											
Indv Supplier Delivery Risk		WSEC	Demand Value Classification	PLT score	2yr CAGE Count	Leading Ind					
1		(Multiple Items)	(Multiple Items)	(Multiple Items)	1	Excluding: (Blank)					
Drop Column Fields Here:											
Drop Row Fields Here:	NIIN	Item Name	CAGE	Supplier Name	Sales Value	Lagging Ind	MWR Source	Indv On-Time %	Indv Avg Days Late	PLT of Record	Indv CLT Extend %
	13887854	EXTINGUISHER, FIRE			P, \$1,451,173.22	Issue		0.00%	34.00	127	
	8801624	LIGHT, PARKING			IC \$708,910.47					290	51.38%
	5656059	FRAME ASSEMBLY			\$146,361.76					122	104.92%
3											

The three prioritization filters described in the previous section are represented here again with two additional filters particular to this risk type. Like the other metrics exclusive to the Supplier Risk Metrics table, Indv Supplier Delivery Risk is a flag that looks at supplier delivery risk for each NIIN-CAGE pair, i.e. an item will be evaluated on this metric and receive a separate flag for every supplier it has had over the last year. The risk aspect of this metric is itself a combination of two other metrics. The first is the Indv Late Flag. An item has this flag if less than 75% of orders from a particular CAGE are on time and the average number of days late for late orders is greater than 30. The second is the Indv CLT Extend %. An item has this flag if the time between the obligation date (award date) of a purchase order and the expected delivery date is more than 120% of the item's PLT of record (The CLT is more than 20% of PLT). Although some conditions that would cause this flag (e.g. first article test) do not always indicate a supplier delivery problem, it should be included and set aside for investigation because a delivery time that is significantly longer than an item's production lead time could indicate a special supplier issue. If either the Indv LATE Flag or the Indv CLT Extend % is flagged for an NIIN-CAGE pair, that pair is flagged for Indv Supplier Delivery Risk.

The two-year CAGE Count filter is set to *one* to capture those items where there has been a single DLA supplier in the last *two* years. This filter is used because it is believed that an item with a single supplier with delivery issues has higher risk to the Warfighter than an item with multiple sources. Combined with the filter for supplier delivery risk, this list focuses on items with active demand whose supplier may be experiencing problems and for which there may be no viable alternative supplier or one that can be readily and quickly accept a share of demand.

2.2.3 Surge – Item Surge Risk

Surge – Item Surge Risk is defined by items that are weapon system unique and have wartime stock out risk. Figure 5 shows the filters that are applied to the Summary Risk Metrics table in order to create this list.

Figure 5 – Surge: Item Surge Risk Form

Surge - Item Surge Risk							
MWR		Sim Wartime FR Flag	Multi-Platform Flag				
Excluding: (Blank) 1		N					
Drop Column Fields Here							
Drop Row Fields Here	NIIN	Item Name	Sales Value	Demand	Sim Wartime Fill Rate	Leading Ind	Lagging Ind
	14631478	PANEL,INDICATOR	\$25,267.48	B	0	Sim-Risk	
	11104002	HANDLE,RAMP LOCK	\$14,067.77	B	0		
	14823040	WIRING HARNESS,BRAN	\$14,037.57	B	0		
	11085093	LEVER,MANUAL CONTRO	\$9,330.31	C	0		Issue
	14670923	BOLT,HOOK	\$8,835.45	C	0	Sim-Risk	
	14632528	WIRING HARNESS	\$7,681.33	C	0		
	12739386	WASHER,FLAT	\$6,382.97	C	0	For-Risk	Issue
	15892298	SUPPORT,SEAT,VEHICU	\$4,303.94	C	0	Sim-Risk	
	14579469	TOWER,ANTENNA	\$3,401.19	C	0		Issue
	11085223	VALVE,SOLENOID	\$3,147.99	D	0		

Only three filters were used to create this list. The Monthly Wartime Rate (MWR) filter selects for only those items with a Service submitted or DLA calculated MWR. As such, the MWR can come from two sources. It can be supplied by the Services themselves or come from analysis of an item's wartime peak demand, which averages over one month the peak six-month demand of requisitions project coded for Iraq or Afghanistan (9GF or 9GJ). The Multi-Platform Flag selects only items exclusive to the BFV in order to screen out items whose wartime demand is primarily driven by other weapon systems. For a Phase II update of this methodology and when the data is available, the study team plans to combine this filter with one that matches items predominantly ordered by DLA customer for a single weapon system, based on an annual customer analysis of requisitions. The Sim Wartime FR Flag filter shows to what extent an item will or will not stock out based on simulated current demand projected over the next six-months plus the monthly wartime rate or MWR added on top. The prioritization filter for WSEC was not used in this case because an item with an MWR is considered to be a more timely measure of essentiality than the recorded WSEC.

Together, these filters create a list of items, exclusive to the Bradley, that have wartime material availability risk independent of the item's supplier situation. Within the SRC tool this Risk Type may have the BFV only or weapon system specific filters removed because the program may not be solely focused on a single weapon system, but rather interested in a broader spectrum of critical items.

2.2.4 Surge – Sourcing Risk

Surge – Sourcing Risk is defined by items that are weapon system unique and have wartime stock out risk, but have no recent DLA buy history. Figure 6 shows the filters that are applied to the Summary Risk Metrics table in order to create this list.

Figure 6 – Surge: Item Surge Risk Form

Surge - Sourcing Risk										
MWR	PLT score	2yr CAGE Count	5yr CAGE Count	LTC Flag	Sim Wartime FR Flag					
Excluding: (Blank)	(Multiple Items)	(Blank)	(Blank)	N	1					
Drop Column Fields Here										
Drop Row Fields Here	NIIN	Item Name	Sales Value	Dema	AMSC	WSIC	AMC	Sim Wartime Fill Rate	Leading Ind	Lagging Ind
	11423434	TOOL SET,SPECIAL,TU	\$35,797.45	A	G	K	1	66.67%		
	11092560	SUPPORT,SHAFT,ROCKE	\$3,313.00	C	C	F	3	4.76%		
	14089161	CIRCUIT CARD ASSEMB	\$3,219.54	C	C	F	3	70.83%		
	11024539	ROD,STRAIGHT,HEADLE	\$3,201.70	C	G	F		0.00%	Both-Risk	
	11073453	SEAT,VEHICULAR	\$2,983.62	D	G	G	1	5.56%		
	11048989	WIRING HARNESS	\$2,646.69	D	G	F	1	50.00%		
	14806063	RELAY,ELECTROMAGNET	\$2,558.19	D	G	F	2	0.00%		
	1269011	STRAP,WEBBING	\$2,316.13	D	G	K		18.81%	Sim-Risk	
	13101824	MODIFICATION KIT,SE	\$2,275.30	D	G	K	1	0.00%		

This risk form has much the same purpose as the one for Item Surge in that it captures items with wartime stock out risk, but it adds additional filters to focus on items that might also be hard to source. To add the sourcing focus, appropriate sourcing filters (also used for the Active Operational – Sourcing Risk form) were included: the item has a longer PLT, it has had no purchase orders or suppliers in *five* years, and it is not on a long-term contract. The Leading indicator may be used as an optional filter to focus on the items where there is an intersection between active operational sourcing issues and surge risk. Doing so would create a list of items with stock-out risk now, current backorders, and surge risk. Here, the leading indicator is not applied as a filter but included in the body of the form to highlight those items which would be selected if it was used as one.

2.2.5 Sustainment – Operational Supplier Sustainment Risk

Sustainment – Operational Supplier Sustainment risk is defined by items that are unique to a weapon system, have consistent DLA orders over the last *two* years, and are flagged for sustainment risk. Figure 7 shows the filters that are applied to the Supplier Risk Metrics table in order to create this list.

Figure 7 – Sustainment: Operational Supplier Sustainment Risk Form

Sus - Operational Supplier Sustainment Risk											
Sustainment Flag	WSEC	Demand Value Classification	2yr CAGE Count	Qtr Count	Multi-Platform Flag						
1	(Multiple Items)	(Multiple Items)	1	(Multiple Items)	All						
Drop Column Fields Here											
Drop Row Fields Here	NIIN	Item Name	CAGE	Supplier Name	Platform Count	Depot %	AAC	Sales Value	Last Qtr Gap	PO Slope	Supplier Density %
	9124248	SWAB,SMALL ARMS			45		D	\$1,989,642.60		-32.85	28.31%
	9927287	RING, BOLT			32	2.47%	D	\$101,977.96	1	-59.89	79.66%

The distinctive filter for this risk form is the Sustainment Flag. This flag is another combination metric that draws from three other risk metrics, PO Slope, Last Qtr Gap Flag, and Supplier Density %. PO Slope is a number calculated off the dollar value of an item's purchase orders over time for a particular supplier. If PO Slope is negative a supplier has experienced a decline in purchase order value for that item over *two* years. The Last Qtr Gap Flag identifies suppliers with orders in at least six of the last *seven* quarters but have had no orders since the beginning of the most recent quarter and have no scheduled future deliveries in the purchase order file. Supplier Density % measures the percentage of overall DLA spend to that supplier which can be attributed to that one item. An item is considered to present a sustainment risk (Sustainment Risk Flag = 1) to a particular supplier if the Supplier Density % is greater than 25% and either the PO Slope is negative and the Last Qtr Gap Flag = 1. If all three of these conditions are met, the supplier sustainment risk is more likely.

The prioritization filters for Demand Value Classification and WSEC are applied in this instance to hone the list to essential items that account for a large amount of spend. The Multi-Platform Flag is set to "N" in order to look at only items coded to BFV. Items with *five* or fewer quarters of demand over the last *two* years were excluded (Qtr Count) as were items with more than one supplier. The team suggests that analysts focus more on suppliers with more active production lines, as identified through by a higher quarter count, e.g. purchase orders delivered in every quarter out of the last *two* years, because there are many suppliers that receive only occasional orders from DLA and cannot depend on DLA to sustain their business with no expectation of future orders. These suppliers often operate a project based production environment versus a continuous production line, and the item's production lead time, should reflect any additional time to order materials and set up any necessary equipment. DLA should be more focused on the suppliers with nearly continuous production lines. In the event the continuous production line cannot be sustained, then the DLA may encounter a significant increase in production lead time in the future and potentially a limitation on capacity available.

In conjunction with the Sustainment Flag, the above filters create a list of critical items that may experience material availability issues because declining or infrequent orders could pose a threat to the survival of the only supplier over the last *two* years.

2.2.6 Sustainment – Surge Supplier Sustainment Risk

Sustainment – Surge Supplier Sustainment Risk is defined by items with consistent DLA orders over the last *two* years, are flagged for sustainment risk, and have a wartime surge requirement. Figure 8 shows the filters that are applied to the Supplier Risk Metrics table in order to create this list.

Figure 8 – Sustainment: Surge Supplier Sustainment Risk Form

Sus - Surge Supplier Sustainment Risk										
Sustainment Flag	Demand Value Classification	2yr CAGE Count	MWR	Sim Wartime FR Flag	Qtr Count					
1	(Multiple Items)	1	Excluding: (Blank)	1	(Multiple Items)					
Drop Column Fields Here										
NIIN	Item Name	CAGE	Supplier Name	AAC	Sales Value	Last Qtr Gap	PO Slope	Supplier Density %	Sim Wartime Fill Rate	
14117240	RECLAIMER, REFRIGERA			D	\$2,081,200.63		-633.19	100.00%	53.19%	
1522033	FILTER ELEMENT, FLUI			D	\$183,925.48		-55.13	100.00%	52.65%	
2										

This risk form captures the supplier sustainment risk through the Sustainment Flag in exactly the same way described in the previous section. However, filters were added to capture only items with an MWR and are at-risk of stock out if demand reaches wartime levels (Sim Wartime FR Flag = 1). The Qtr Count and two-year CAGE Count metrics were set as they were for Operational Supplier Sustainment risk, as was Demand Value Classification for prioritization. WSEC was excluded because essentiality was again captured by virtue of the item having a MWR. Together, these metrics define a list of items that pose a sustainment risk to a supplier, but have the added criticality of a wartime surge requirement.

2.3 Active Operational – Supplier Delivery Risk Validation

The study team conducted a validation assessment for the Active Operational – Supplier Delivery Risk Type with the help of Industrial Specialists from DLA Land & Maritime in order to assess the number of items flagged as having industrial base issues versus non-industrial base issues. Regarding the BFV analysis the team identified 14 items that have a potential industrial base issue based on supplier performance and contract lead time metrics. The Industrial Specialists had some difficulty finding the DLA post award contracting representatives in a number of cases. When the DLA contracting representative was identified, he or she was contacted to gain situational awareness as to why the item or supplier was delayed in delivery. The results of the validation assessment demonstrated that there are indeed false positives within this Risk Area/ Type. There were several items where the DLA contracting representative did not have any information available to explain why the supplier was delinquent. Unfortunately the full results of the validation were not available for this report because it is expected to continue for a few more weeks and may require direct contact with the supplier, which will likely require cooperation with DLA contracting representatives.

The validation effort revealed that it may be difficult to identify industrial base issues without directly contacting the supplier, as the DLA buyer representative did not know why a supplier was late in a few cases. This raises potential concerns because Industrial Specialists may need to obtain contracting officer approval before contacting suppliers to discuss supplier related problems, which could slow down the risk assessment process. Overarching policies exist to allow DoD personnel to request general industrial base data on a voluntary basis from suppliers related to specific items; however, it's important that procurement discussions related to current contracts be avoided unless authorized contracting officers/ representatives are directly involved, even if several of the metrics used to flag a supplier reflect performance on current

contracts.¹² These issues need to be resolved, as part of the JICAP requirements development process and may require a DLA legal review.

DCMA field personnel may be able to support a portion of the root cause analysis by contacting or visiting a target supplier to complete a short questionnaire to identify whether or not there may be an industrial base issue. In some cases, DCMA field support may already have a working relationship with a target supplier and regularly visit the supplier for QAR inspections. In fact, DCMA may have “in house” offices at larger DoD contractors, which may be better able to shed light on industrial base problems.

2.4 AMC-DLA Supplier Risk Analysis Phase II & SRC integration

As the joint industrial base study team wraps up Phase I of the analysis, Phase II of the study is begin planned. This next phase will establish the proof of concept for the Root Cause Analysis portion of the JICAP for the at-risk items identified in Phase I. The tasks involved will revolve around the joint industrial base community’s efforts in identifying supply constraints within the industrial base. DCMA will also support Phase II by leveraging their working relationship with participating suppliers in order to complete an assessment that will gather specific details concerning the constraint, e.g. raw material lead time, process bottlenecks, contracting issues, etc. Once the root cause has been identified the team can then begin to explore ways in which to mitigate the item/ supplier risk by conducting a detailed supplier capability analysis. The team will test various solutions with the supplier by simulating the process and supply chain using commercial modeling software. The root cause analysis process and recommended solutions will be summed up in a report for use in a subsequent phase of the JICAP. Further, the joint study team will recommend, define, and develop a procedure/ work instructions between the Service, DCMA, and DLA to include a man-hour estimate by organization, a revised root cause analysis questionnaire, and a process for the using data collection tool in future IB risk analysis.

Table 3 depicts the overall JICAP timeline which includes the ongoing development of the SRC tool. The SRC tool should provide high-level visibility for Service and DCMA stakeholders that are working on risk assessments and mitigation actions in collaboration with DLA management and should become the backbone of the JICAP. Although the scope of this study did not include developing SRC requirements beyond the risk categorization and flagging methodology, the team anticipates that the SRC would support the JICAP through risk identification, root cause analysis, risk mitigation, and execution. The intent is to continue executing the JICAP framework leveraging lessons learned from Phase I with NAVAIR and AMC in subsequent assessments of different weapon systems and other Services.

¹² 50 USC App 2155: Investigations; records; reports; subpoenas; right to counsel

Table 3 – JICAP Proposed Timeline

JICAP Timeline (Draft)												
FY 12				FY 13				FY 14				
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
SRC Tool												
Phase II Development												
Cord. Phase III Reqs.												
Phase III Development												
Process Development												
Concept Dev.												
NAVAIR / DLA PHASE I												
AMC / DLA PHASE I												
JICAP Proof of Concept												
AMC / DLA PHASE II												
NAVAIR / DLA / DCMA PHASE II												
OTHER STAKEHOLDERS												
Initial JICAP Implementation												
Dev/ Coord WG Charter												
Config/ Control Board												
Repeatable Joint Process Begins												

* Scope and timing of this effort will be determined in FY13

Appendix A – Data Requirements

The BFV analysis utilized the data sources shown in Table A5 and the data fields provided in Table A6. Ideally, the SRC should try to establish direct links to DLA enterprise business systems to pull in specific data or metrics. All data files were provided by DORRA for the BFV risk assessment. The data requirements for this study are similar to the data available in DLA's eMall system.

Table A4 – BFV Risk Methodology Data Requirements

File Name	Importance	Description	Recommended Refresh	Comments
Material Master Data	<i>Required</i>	Item level demand and supply statistics	Monthly	This file sets the scope of the number of items in the risk assessment; Recommend developing critical item lists for each supply chain, e.g. specific WSIC or WSEC codes, to reduce the data requirements for the risk assessment.
Requisition Data	<i>Required</i>	DLA customer requisitions	Monthly	Records are limited only to NIINs in the Material Master file and only for requisitions placed in the last 12 months. For the first population risk assessment, 10 years' worth of requisitions in order to identify the peak 6-month demand quantity and starting period (includes separate analysis of peak based on wartime project codes). Subsequent refreshes can be queried to see if a new peak has been established; Can use either the raw data in transactional form (very large) or DORRA's aggregated file.
Purchase Order (PO) Data	<i>Required</i>	Awarded DLA Purchase Orders	Monthly	Records are limited only to NIINs in the Material Master file and only those orders with obligation dates < 3 years ago; This file includes orders that are scheduled in the future. The DORRA chist10yr file provides supplier orders beyond 3 years.
Purchase Request (PR) Data	<i>Required</i>	All current PR's in DLA's procurement system	Monthly	Records are limited only to NIINs in the Material Master file; Queries filter on awarded and open PR lines. This data is used in the ProModel simulations for the leading indicator (projected 6-month fill rate) and wartime fill rate. It is also used in general analysis to see if there are future DLA orders in the pipeline.
CAGE Information	<i>Required</i>	Provides ability to associate supplier information with a CAGE code from PO data	Quarterly	This file combines data available in DORRA's Cageaddr file provided annually to the Industrial Capabilities Program as part of the WICAP data pull, but includes the current Status code for the supplier's BINCS record. For the BFV study, the team used the dataset available for download under FOIA from BINCS. At a minimum this data should include all CAGES in the PO and chist10yr file.

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August 15, 2012

Forecast Data	<i>Required</i>	Monthly item forecasted demand	Monthly	Records are limited only to NIINs in the Material Master file; Should be based on the current published forecast by the DLA demand planner and include SPR or DDE forecasts; Used in the leading indicator calculation projecting a stock-out over the next 6-months.
Weapon System File (wpn)	<i>Required</i>	Associated NIIN to WSDC, WSGC and WSEC	Quarterly	Records are limited only to NIINs in the Material Master file to reduce size of the dataset. This file is used to count the number of platforms and determine whether or not it is unique to a single weapon system.
Weapon System Name File (wpnname)	<i>Required</i>	Associates WSDC to Weapon System name and using Service	Quarterly	This file is used to return the name of the weapon system matching the WSDC, e.g. when the item is sole source.
Summary DLA 10 Year Spend History (chist10yr)	<i>Required</i>	Contract qty and value summed by NIIN by CAGE and by FY	Annually	Records are limited only to NIINs in the Material Master file; This file is prepared annually at the end of each FY as part of the WICAP data pull for the Industrial capabilities Program.
LTC Data	<i>Required</i> (Can be eliminated)	Identifies items currently on long term contracts	Monthly	This file can be eliminated if a flag is added to the material master to identify whether or not the item is currently on a DLA long term contract.
Surge Requirements	<i>Required</i>	Most recent surge requirements in the Industrial Base Maintenance System (IBMS)	Annually	This data is managed by the DLA Industrial Capabilities Program and is based on the Services' annually submitted requirements.
Demand & Supply Chain Crosswalk	<i>Optional</i>	NIIN to predominant demand platform	Annually	Recommended dataset; Records are limited only to NIINs in the Material Master file; This file is prepared annually for DLA and was provided by DLA Aviation representatives for the NAVAIR study. The team was unable to get a version of this file for the BFV study.
DODAAC Information	<i>Optional</i>	Provides ability to associate customer information with a DODAAC code from requisition data	Quarterly	This file was used in the BFV analysis to identify specific DODAAC's that were supporting depot activities for the BFV. It is not expected to be used in the SRC, except for general requisition analysis as needed.
FSC Names	<i>Optional</i>	Provides ability to associate an FSC name with FSC in the Material Master file	Annually	Allows risks to be rolled up by FSC name. This data was not utilized for the BFV study.
Part Number Reference Data	<i>Optional</i>	Supplier Part Number reference data matching	Quarterly	Records are limited only to NIINs in the Material Master file; Used for general sourcing background data. Provides the NIIN, Part number, CAGE, RNCC, and RNVC; This data was not utilized for

		NIINs		the BFV study.
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Table A5 – Specific Data Fields used in the BFV Risk Methodology

NIIN	Description	Data Source
ITM_NAME	Item name	Material Master Data
FSC	Federal Supply Class	Material Master Data
SALES_UOM	Sales unit of measure	Material Master Data
BASE_UNIT_MEASURE	Base unit of measure	Material Master Data
SALES_UNIT_CONV_FACT	Sales unit of the item	Material Master Data
MAdate	Management Assumed Date	Material Master Data
ALTofrecord	Administrative Lead Time	Material Master Data
PLTofrecord	Recorded Production Lead Time of the item	Material Master Data
WSEC	Weapon System Essentiality Code	Material Master Data
WSIC	Weapon System Indicator Code	Material Master Data
AAC	Acquisition Advice Code	Material Master Data
AMC	Acquisition Method Code	Material Master Data
AMSC	Acquisition Method Suffix Code	Material Master Data
LDdate	Date of the last customer order	Material Master Data
BOQTY	Qty of the item on backorder	Material Master Data
IAQ	Qty of the item on-hand & available for sale	Material Master Data
Slqty	Safety Level Quantity	Material Master Data
pcm	Procurement Cycle Months	Material Master Data
STD_U_PRICE	Current DLA customer unit price	Material Master Data
COST_BASIS_PRICE	Average DLA acquisition unit cost	Material Master Data
NIIN	NIIN	Requisition Data (DORRA)
DIC	Document Identifier Code	Requisition Data (DORRA)

doc_num	Requisition or Document Number	Requisition Data (DORRA)
DOB	Date of Birth of requisition	Requisition Data (DORRA)
SUPPMTL_DODAAC	Supplementary Address	Requisition Data (DORRA)
ship_date	Ship date or most recent ship date	Requisition Data (DORRA)
RDD	Required Delivery Date	Requisition Data (DORRA)
PRI_CD	Priority code	Requisition Data (DORRA)
PROJ_CD	Project Code	Requisition Data (DORRA)
DLA_DIRECT	DLA Direct Flag	Requisition Data (DORRA)
CUSTOMER_DIRECT	Customer Direct flag	Requisition Data (DORRA)
ORIG_QTY	Original requisition qty	Requisition Data (DORRA)
CANC_QTY	Cancelled requisition qty	Requisition Data (DORRA)
REJ_QTY	Rejected requisition qty	Requisition Data (DORRA)
SHIP_QTY	Ship quantity	Requisition Data (DORRA)
REQ_NET_QTY	Net quantity	Requisition Data (DORRA)
UI	Unit of Issue	Requisition Data (DORRA)
NIIN	NIN	Weapon System File
WSDC	Weapon System Designator Code	Weapon System File
WSEC	Weapon System Essentiality Code	Weapon System File
WSGC	Weapon System Group Code	Weapon System File
WSDC	Weapon System Designator Code	Weapon System Name File
srvc	Service that submitted data	Weapon System Name File
dname	Weapon System Designator Code	Weapon System Name File
NIIN	NIIN	Purchase Order Data
ORDER_QUAN	Qty of the item on ordered on an individual purchase order	Purchase Order Data
BPO_NUM	Unique PO Identifier	Purchase Order Data

BPO_ITMNO	Unique PO Item Identifier	Purchase Order Data
QTY_RCVD	Qty of item received	Purchase Order Data
FSCHDELDT	Scheduled delivery date of the PO	Purchase Order Data
FACTDELDT	Actual date of delivery for the qty received	Purchase Order Data
CAGE	CAGE code of the vendor	Purchase Order Data
NET_PO_VAL	Net value of the PO	Purchase Order Data
NIIN	NIIN	Purchase Request Data
BIC_BPO_NUM	Unique PO Identifier	Purchase Request Data
BIC_BPO_ITMNO	Unique PO Item Identifier	Purchase Request Data
BIC_BPURREQNO	Unique PR Identifier	Purchase Request Data
BIC_BPR_ITMNO	Unique PR Item Identifier	Purchase Request Data
BIC_BPRJAWDT	Projected award date for PR	Purchase Request Data
ORDER_QUAN	Order quantity	Purchase Request Data
BIC_BLINESTAT	PR Status, e.g. awarded, open, cancelled	Purchase Request Data
CAGE	Commercial and Government Entity code	CAGE Information
CAGE Name	Supplier name	CAGE Information
Status	CCR/BINCS status code	CAGE Information
NIIN	NIIN	LTC Data
CAGE	CAGE	LTC Data
PIIN	Contract number	LTC Data
NIIN	NIIN	Forecast Data
YEAR	Calendar Year	Forecast Data
MONTH	Month	Forecast Data
FCSTQTY	Forecast quantity	Forecast Data
DODAAC	DoD Acquisition Activity Code	DODAAC Information Data
TAC1_CITY	City 1	DODAAC Information Data
TAC1_LINE1	Organization name 1	DODAAC Information Data
TAC1_LINE2	Organization name 2	DODAAC Information Data

TAC1_STATE	State	DODAAC Information Data
TAC1_STREET_ADDR	Address 1	DODAAC Information Data
TAC1_ZIP	Zip code	DODAAC Information Data
TAC2_CITY	City 2	DODAAC Information Data
TAC2_LINE1	Organization name 3	DODAAC Information Data
TAC2_LINE2	Organization name 4	DODAAC Information Data
TAC2_STATE	State	DODAAC Information Data
TAC2_STREET_ADDR	Address 2	DODAAC Information Data

Appendix B – Risk Metrics Definitions

Table B6 – Item Data

Metric	Definition
WSIC (Weapon System Indicator Code)	A rating of the criticality of the item. WSIC codes ranked in order of highest criticality: F, G, H, I, T, M, W, P, X, J, R, Y, K, S, and Z. N indicates no weapon system application. DLA identifies the highest weapon system criticality related to each NIIN, which or may not be the BFV “37A” WSDC. Therefore you might find an item with high WSIC rating, but not a WSEC 1 or 7 for the BFV.
WSIC Flag	Flag is “Y” for top WSIC’s F, G, and H. Flag is “N” for all others.
WSEC (Weapon System Essentiality Code)	Another essentiality metric. WSEC of 1 indicates that item failure renders the weapon system inoperable. WSEC of 5 indicates an item that will deadline a weapon system for safety. WSEC of 6 is indicates an item that the weapon system depends on for operation in particular regions/ environments. For the BFV study the team typically filtered on items that are WSEC 1, 5, or 6.
Multi-Platform Flag	Flag is “Y” if the item is used by more than one platform. Flag is “N” if it is exclusive to the BFV.
Platform Count	The number of platforms that utilize the item.
Demand Driver Flag	(Pending data from DORRA). The Flag is 1 if BFV-based requisitions account for more than 80% of the item’s overall DLA demand. Based on the DLA “Crosswalk” file.
AMC (Acquisition Method Code)	Indicates whether the item is suitable for competitive acquisition. 1 and 2 are competitive. 3 and higher indicates competitive restrictions. See Appendix B.1
AAC (Acquisition Advice Code)	Indicates how and under what restrictions an item will be acquired by DLA. Also used to identify inactive, semi-active, or terminal items.
AMSC (Acquisition Method Suffix Code)	Indicates who has the rights to the technical data of an item and the condition of the technical data package if owned by the Government. See Appendix B.2
AMSC Flag	Flag is “1” for AMSC codes that indicate restrictions on tech data package ownership. The flag is null for an AMSC of G or Z, meaning the government owns the tech data package or the item is commercially available.

PLT of Record	The production lead time as calculated by DLA. Typically calculated based on the average time from delivery order award to delivery at DLA's depots
PLT Score	Divides PLT into quartile scores of 1-4. "1" - 77 days and below. "2" - between 78 and 120 days. "3" - between 121 and 171 days. "4" - 172 days and above.
Backorder QTY	Quantity of items on backorder as of the data pull date.
Issuable Asset QTY	Issuable asset quantity (from DORRA material master file)

Table B7 – Requisition Analysis

Metric	Definition
Last Demand Date	Date of the last recorded requisition.
Monthly Demand	Average monthly demand over the last 12 months.
6 mo Peak Demand	Highest level of demand over six months for any six month period since 2003.
6 mo Peak Month	Starting month of the six month peak demand period.
Peak to Average	A ratio showing the historical peak demand quantity divided by average demand over the last twelve months. A higher number indicates greater variability between peak and average demand.
Standard Deviation Index	The daily standard deviation of demand over the last 12 months divided by the average daily demand. Does not include days with zero demand.
MWR (Monthly Wartime Rate)	Monthly rate of demand that could be expected in order to support wartime operations.
MWR Source	Source of the Monthly Wartime Rate number. The MWR for an item is determined from two primary sources. "War Peak Add" means the MWR was calculated by analyzing the peak of requisitions project coded for operations in Iraq and Afghanistan (9GF or 9GJ). "MWR" means the quantity came from the MWR report submitted annually by the Services.
Demand Frequency	Number of days in the last 12 months that had demand.
Current 6 mo Fill Rate	Fill rate of all requisitions over the last 6 months, includes non-Army customers.
IPG1 6 mo Fill Rate	Fill rate for all high priority IPG1 Army requisitions over the last 6 months.

Lagging Ind	Flag shows "Issue" if "IPG1 6 mo Fill Rate" is less than 75%.
Forecast 6 mo Fill Rate	DLA forecasted fill rate over the next 6 months for all items for which a DLA forecast exists taking into account current backorders, stock on hand and projected due ins. Forecasted fill rates were determined for items that met these criteria: Active items in last year, "WSEC 1 or 7, low inventory, and AAC "D", "Z", or "J".
Simulated 6 mo Fill Rate	Simulated fill rate for the next 6 months taking into account current backorders, stock on hand, projected due ins, demand frequency, demand trend, standard deviation of demand, and average demand. Simulated fill rates were determined for items that met these criteria: Active items in last year, "WSEC 1 or 7, low inventory, and AAC "D", "Z", or "J".
Leading Ind	Flag shows "Risk" for projected 6 month fill rates of less than 85%. The flag indicates whether the risk is according to the forecasted fill rate, simulated fill rate, or both.
Leading Ind Flag	Flag is "1" for items flagged for risk according to the forecasted fill rate, the simulated fill rate, or both.
Forecast Qty	Forecasted demand quantity over the next 6-months as identified by DLA's demand planners. Used in the forecasted fill rate calculation.
Simulated Demand	Quantity of demand generated in the simulation.
6 mo PR Qty	Quantity of the item on all open Purchase Requests over the next 6 months with a projected delivery date within the next 6-months (projected award date plus PLT of Record). Used in the leading indicator calculation.
Wartime Req Qty %	Of the total quantity of the item on all requisitions over the last 12 months, the percentage that was on requisitions that had project codes for operations in Iraq and Afghanistan (9GF or 9GJ).
Wartime Flag	Flag is "1" for all items for which at least 25% of requisition quantities were coded to 9GF or 9GJ over the last 12 months.
Depot Fill Rate	Fill rate of the last 6 months of requisitions from the top 5 BFV depot DODAACs: Letterkenny Army Depot (W25G1Q), Anniston Army Depot (W31G1Y), and Red River (W45G18, W56BQ0, and W800WD).
Depot QTY	Quantity of the item on all requisitions to the top 5 depot related BFV DODAACs by total demand value over the last 12 months.
Depot %	Percentage of total demand value of all requisitioned quantities that were for the top 5 depot related BFV DODAACs over the last 12 months.
LTC Flag	Flag is "Y" if the item is on a current long-term contract and "N" if it is not.
Sim Wartime Fill Rate	Simulated Fill Rate for the item over the next 6 months if the monthly wartime rate was added to current demand.
Sim Wartime FR Flag	Flag is "1" if "Sim Wartime Fill Rate" is less than 75%.

Table B8 – Purchase Order Analysis

Metric	Definition
Total 3 yr Orders	Total number of purchase orders issued over the last 3 years.
Total Order Item QTY	Total quantity of the item on purchase orders over the last 3 years.
Analyzed QTY	Total quantity of the item on purchase orders that were used for on-time analysis. Purchase orders were eliminated from this analysis for several reasons. POs which are due after the date of the data pull could not be classified as either on-time or late. Also, since recent supplier performance was determined to be of the highest value, the analyzed PO window was limited to the last 12 months as opposed to 3 years.
PO QTY Due	Total quantity due in on outstanding purchase orders over the next six months. Used in leading indicator calculation.
Late QTY	Total quantity on analyzed POs that was late (actual delivery > scheduled delivery).
On-Time QTY	Total quantity on analyzed POs that was on-time.
On-Time %	Percentage of the analyzed quantity that was on-time.
Late Orders	Number of analyzed orders that were entirely or partially late.
Avg. Days Late	Average number of days late for all late orders.
Late Flag	Flag is "1" if the On-Time % metric is less than 75% and the Avg. Days Late metric is over 30 days.
Extended CLT Flag	Flag is "1" if the Contract Lead Time for a Purchase Order within the last year is more than 20% of the PLT of record for the item.
Warm Base Flag	Flag is "1" if the following conditions were met: for a purchase order that had not yet been delivered, the obligation date is within a number of days (PLT + 20%) to the date of the data pull. This metric is designed to capture items with purchase orders that are currently being processed or have just been processed; therefore the industrial base is likely to still be "warm".

Table B9 – Supplier Risk

Metric	Definition
CAGE Status Flag	Flag is "Y" if any PO for the item was from a supplier flagged for status risk over the last 3 years. Flag is "N" if no POs were from suppliers with status risk. "No PO Data" indicates there was no PO data to make this distinction. A

	supplier is flagged for status risk if its status code indicates that it is either debarred, obsolete, or canceled according to a DORRA supplier information table.
Good CAGE Status QTY	Quantity of the item from CAGEs not flagged for status risk on Purchase Orders over the last 3 years.
Risky CAGE Status QTY	Quantity of the item from CAGEs flagged for status risk on Purchase Orders over the last 3 years.
Risky CAGE Status %	Percentage of the item purchased from CAGEs with status risk out of all Purchase Orders over the last 3 years.
2 yr CAGE Count	Number of CAGEs supplying the item for the last 2 years based on Purchase Order data.
5 yr CAGE Count	Number of CAGEs supplying the item for the last 5 years based on DORRA fiscal year spend history files.
Different Supplier Flag	Flag is "Same Supplier" if the supplier indicated by a value of 1 in the "CAGE Count Sep07 – Sep10" metric is the same supplier as the supplier indicated by a value of 1 in the "CAGE Count Apr10 – May12" metric. Flag is "Different Suppliers" if they are different.
Supplier Deliver Risk	Flag is "1" if either the "Late Flag" or the "Extended CLT Flag" is 1, indicating risk to on-time delivery.

Table B10 – Cost Analysis

Metric	Definition
Standard Unit Price	The standard unit price of the item.
Unit Price Score	A score which divides standard unit price into 5 categories: "5" is for items with a standard unit price of \$10,000 and above, "4" for between \$1,000 and \$9,999, "3" for between \$100 and \$999, "2" for \$10 to \$99, and "1" for items less than \$10.
Sales Value (by std unit price)	The average annual demand multiplied by the standard unit price and divided by a unit conversion factor which takes into account the item's unit of issue.
Demand Value Classification	A classification which divides the total value of annual demand (according to acquisition cost) into quartiles A, B, C, and D. A to D is greatest to least demand value.

Table B11 – Individualized Supplier Analysis

Metric	Definition
CAGE	CAGE Code for the supplier. May be a distributor and not the actual manufacturer.

Supplier Name	Name of the supplier.
CAGE Status Code	Status code of the supplier as related to DoD procurement. Codes A, C, J, K, M, R, T, U, W, and Y do not have status risk. Code E is listed as "Debarred". Codes F and H are "Obsolete". Codes N and P are "Canceled without replacement record".
Status Definition	Definition is listed for status codes with risk (E, F, H, N, P).
Indv Status Flag	Flag is "Y" for all risky CAGE status codes and "N" for all others.
Indv Total 3 yr Item Qty	For each supplier, total quantity of the item on purchase orders over the last 3 years.
Indv Total Analyzed Qty	For each supplier, total quantity of the item on purchase orders that were used for on-time analysis. Purchase orders were eliminated from this analysis for several reasons. POs which are due after the date of the data pull could not be classified as either on-time or late. Also, since recent supplier performance was determined to be of the highest value, the analyzed PO window was limited to the last 12 months as opposed to 3 years.
Indv Late Qty	For each supplier, total quantity on analyzed POs that was late (actual delivery > scheduled delivery).
Indv On-Time Qty	For each supplier, total quantity on analyzed POs that was on-time.
Indv On-Time %	For each supplier, percentage of the analyzed quantity that was on-time.
Indv Avg Days Late	For each supplier, number of analyzed orders that were entirely or partially late.
Indv Late Flag	For each supplier, flag is "1" if the On-Time % metric is less than 75% and the Avg. Days Late metric is over 30 days.
Indv CLT Extend %	For each supplier, the ratio of the Contract Lead Time to the PLT of record.
Indv CLT flag	For each supplier, flag is "1" if the Contract Lead Time for a Purchase Order within the last year is more than 20% of the PLT of record for the item.
Indv Supplier Delivery Risk	For each supplier, flag is "1" if either the "Indv Late Flag" or the "Indv CLT Flag" is 1, indicating risk to on-time delivery.
Qtr Count	The number of quarters out of the last 8 (two years) in which a purchase order was placed to the supplier for the item.
PO Slope	This metric is intended to be used with the "Quarter Count" metric, which is the count of quarters for which a supplier has delivered Purchase Orders over the last 8 quarters and is used to determine how consistently active a supplier's production base has been. The slope formula ("rise over run") is calculated for the sum of quarterly Purchase Order values over 8 quarters by actual delivery date; Only negative slopes ("fall over run") are returned in the formula. A negative slope shows a decreasing value of orders over two years.

Last Qtr Gap Flag	Suppliers with a "Quarter Count" of at least 6 quarters over the last 7 quarters (suppliers with a consistently active production base) that have had no deliveries since the start of the final quarter and have no future scheduled deliveries on record in the Purchase Order file. The "6 Month PR Qty" field can be used to see if there are Purchase Requests with delivery projected within the next 6-months to understand the severity of the gap.
Supplier Density %	This metric is used to see how high the annual sales value for a specific item is relative to its supplier's total annual sales value. It is calculated by taking the sum of the DLA Purchase Order values for a unique item and supplier pair for the most recent Fiscal Year divided by the sum of the DLA Purchase Order values for the same supplier for the same Fiscal Year. The metric is based entirely on DLA spend data.
Sustainment Flag	Flag is "1" if "Supplier Density %" is greater than 25% and either the "PO Slope" is negative or the "Last Qtr Gap Flag" = 1. This is the primary flag used to identify suppliers that may have financial risk because of declining orders for an item that accounts for a large percentage of their DLA business.

Appendix C – Points of Contact

Command	Person	Phone	E-mail
Army Materiel Command (AMC)			
Edgewood Chemical Biological Center (ECBC)			
TACOM Life Cycle Sustainment Command (LCMC)			
Defense Logistics Agency (DLA)			